The length of the cephalothorax is 15 mm.

The colour in spirit is dark brown.

P. dehaani has been found in Japan and the Loo Choo Islands; *P. obtusipes* in the Loo Choo Islands and the Philippines.

P. bicristatum de Man, 1899, is an allied species from Borneo (Mount Liang Koeboeng). In view of the peculiarities of the distribution of the genus, it seems best to choose a territorial name for the new species. That of *kadamaianum* is therefore proposed, derived from the name of the river in which the present specimen was found.

1 ♀; Kadamaian River, Kina Balu, 2100 feet.

2. On the Mammals obtained in South-western Arabia by Messrs. Percival and Dodson. By Oldfield Thomas, F.Z.S.

[Received December 19, 1899.]

On the initiative of Mr. Ogilvie Grant, and by the active assistance of General Creagh, Governor of Aden, an expedition was arranged during the past autumn to South-western Arabia for the purpose of obtaining zoological specimens for the British Museum. The expedition consisted of Mr. A. B. Percival and Mr. W. Dodson, the latter having especial charge of the mammal-collecting.

Mr. Dodson had already had some experience as a collector of small mammals during a trip to Roumania in the spring, and he had shown such keenness and aptitude for the work that he would evidently have become an exceptionally able collector, but most unfortunately he contracted fever at El Khaur, and having been brought back to Aden by Mr. Percival, died there on the 20th of October.

The present collection, in the formation of which Mr. Dodson took, to the last, the most vivid interest, is naturally very similar in character to that obtained by Col. Yerbury in the same region in the spring of 1895, of which an account was given by its collector and myself in the Society's 'Proceedings' for that year[1]. Further examples of the interesting Gerbilles discovered by Col. Yerbury were obtained and valuable series of various other forms.

The following species are additional to those recorded in the previous list:—*Papio arabicus*, *Canis pallipes*, *Vulpes leucopus*, *Mellivora ratel*, *Gerbillus gerbillus*, *Procavia syriaca jayakari*.

The animal that proves to be of greatest interest is the Baboon, of which one specimen, unfortunately a female, but fully adult and in good condition, was obtained. This specimen is so different from the African *Papio hamadryas* as to require specific distinction.

The collection was made mainly in two districts—the one at and around Lahej, Col. Yerbury's chief collecting-ground, and the

[1] P. Z. S. 1895, p. 542.

other in the neighbourhood of El Khaur, a place about forty miles north-east of Aden, and some twenty-five miles west of Shukra. But, as might be expected, no definable difference is to be found in the animals of the two localities.

The notes on habits &c. placed in inverted commas have been contributed by Mr. Percival.

1. Papio arabicus, sp. n.[1]

a. ♀. Subaihi Country, about 60 miles north-west of Aden. Alt. 1000 metres, 16th October, 1899.

"The mountains run up to nearly 2000 metres, but the Baboons keep to the lower slopes."

Allied, so far as can be determined from the female, to *Papio hamadryas*, and therefore probably the form from Aden which has been commonly referred—though without the examination of specimens—to that species[2]. But this is by no means certain, and it may be that either the true *P. hamadryas* occurs naturally in the Aden district, or that examples of it have been brought across from Somaliland to Aden during the long-continued native intercourse between the two places, and that the Aden herd is the offspring of escaped specimens.

But whatever may be the case with the herd occurring close to the town of Aden, certain it is that the present specimen, which was obtained by a native about sixty miles to the north-west, cannot be referred to the true *P. hamadryas*.

The main difference appears to be in size, but it unfortunately happens that while the present example is a female, all the available specimens of *P. hamadryas* are males, so that sexual difference has to be allowed for in distinguishing the two forms.

But greatly as the sexes of Baboons may differ in general size and length of skull, the dimensions of the teeth, at least of the cheek-teeth, seem almost or quite unaffected by sex. Thus of a pair, male and female, of the East-African Baboon (*Papio thoth*) of about the same age (the male slightly older, but both rather immature), the following are the respective measurements (in millim.) of the skull and teeth:—

	Total length of skull.	Combined lengths of 5 upper cheek-teeth.	Combined lengths of 4 posterior lower cheek-teeth[3].	Length of last lower molar.
♂	187	50	46	15
♀	159	50	46·4	15·6

The teeth are therefore of about the same dimensions in the two sexes, in spite of the difference in the size of the animals themselves. A similar result has been found in Man, and is, indeed,

[1] Preliminary notice, P. Z. S. 1899, p. 929.

[2] See Matschie, SB. Ges. nat. Freunde, 1893, p. 25.

[3] The anterior lower premolar in Baboons partakes of the sexual specialization of the canine, and has therefore to be eliminated in a comparison of this sort.

common throughout the Mammalia. Naturally every craniologist is more or less familiar with this fact, but in describing a new species on such material as the present it is necessary to emphasize the value of the size of the teeth as a criterion of species, irrespective of sex.

Taking for comparison a good adult skull of a male Hamadryad from Abyssinia we find, in marked contrast to those given above, the following dimensions (in millim.):—

	Total length of skull.	Combined lengths of 5 upper cheek-teeth.	Combined lengths of 4 posterior lower cheek-teeth.	Length of last lower molar.
♂. Abyssinia ..	174	50·4	48	17·4
♀. Arabia	140	41·5	39·5	13·1

Such a difference in the size of the teeth evidently indicates specific distinction.

In its general physiognomy the skull is, as might be expected, much less prognathous than that of the male of *P. hamadryas*, the orbits are similarly high and rounded, the facial ridges are less marked, the chin is much developed, and the shape of the coronoid is different, being more vertical and less slanted backwards. The complete measurements of the skull are as follows (in millim.):—

Greatest length (gnathion to occiput) 140, basal length (gnathion to basion) 98; zygomatic breadth 90; gnathion to lower edge of orbit 61; tip of nasals to orbit 32; orbits, width 24, height 22·5; brain-case, length from occiput to nasion 91, breadth on squamosals 67; interorbital breadth 46; palate length 57, breadth outside tooth-row 44; lower jaw, length from condyle 101, height at coronoid 50.

In its external characters the skin may be described as follows:—

Fur thin and scanty, rather wavy in texture across the back, the hairs across the shoulders but little lengthened beyond the rest. General colour dull greyish; the hairs on the crown and those of the middle line of the loins annulated, blackish with a buffy subterminal ring, those on the temples, sides of neck, shoulders, and flanks unannulated, dull grey. Hairs on the rump above the callosities with a strong rufous suffusion. Under surface and inner side of limbs practically naked. Hairs of arms and legs scanty, dull greyish, gradually passing into annulated black and whitish hairs on the hands and feet. Tail-hairs annulated above, pale greyish below, those at the tip forming a small dull whitish tuft.

Measurements of a remade skin, approximate:—

Head and body 590 mm., tail 410, hind foot 135.

Considering the former extension of the genus into India, it was quite to be expected that the Arabian Baboon should prove different to that found on the African side of the Red Sea. But it may be noted that the two Siwalik species, *Papio subhimalayanus* and *P. falconeri*, both have teeth as large as (or larger than) any of the African Baboons.

2. Rousettus stramineus Geoffr.

a–d. Lahej, 19th August.

"*Large Fruit-Bats.*—These fine Bats were seen for a few days in considerable numbers among the palms near Lahej, but only for a very short time, less than a week. They are very noisy in their roosting-places, squeaking and swearing, making a great fuss early in the mornings. They were feeding, so far as I could make out, on dates, which were just ripe. They and the crows are so troublesome when the dates are ripening that every bunch is put into a bag made of palm-leaves for protection. We had some difficulty in getting these Bats down; if killed they remained hung up, it was only the wounded ones who tried to move about that came down. They hung in bunches of 10 to 50 on the highest palms in the plantation, and were not at all easy to move when once they had hung up for the day."

3. Rousettus amplexicaudatus Geoffr.

a–d. Lahej, 22nd August.

e, *f* (2 in alc.). Lahej, 22nd August.

In the previous paper on Aden mammals this Bat was referred to *R. ægyptiacus*, but in Dr. Matschie's recent work [1] it is assigned to *R. amplexicaudatus*, and pending further enquiry I use that name. I am, however, sure that *R. ægyptiacus* and *R. amplexicaudatus* cannot always be distinguished by the palate-ridge character used in Dr. Matschie's synopsis of species.

"*Small Fruit-Bats.*—In working up Wadi Bilih we found a cave or rather passage in the bank, which had been cut out by water and is about 15 yards through, from 15 to 20 feet high and about 6 to 12 feet across. About the mouth of the cave there were always a few Rock-Doves, but inside the roof was covered by Bats. The Bats were very easily driven out into sunlight, where they flew all round, settling on sides of the wadi in clusters of 10 to 20. On the first occasion I was at the cave after driving out the Bats I was making my way down the gully into the wadi, when I heard a thud in the air: I looked up just in time to see a Falcon passing over and a Bat falling to the ground. I waited a few minutes and as the Falcon came down on to the Bats again I got a shot and killed him neatly. On several occasions when at the cave and Bats were driven out, Falcons came down on to them. I bagged one more."

4. Triænops persicus Dobs.

a, *b* (in alc.). No exact locality.

5. Hipposiderus (Asellia) tridens Geoffr.

Yerb. & Thos. P. Z. S. 1895, p. 546.

a–d. Skins, and a number of specimens in spirit. Lahej, Sept. 1899.

[1] Flederm. Berl. Mus. i. p. 65 (1899).

These specimens are larger than Egyptian examples, agreeing in size with Anderson's "var. *murraiana*" from Karachi[1]; the latter form is also recorded by its describer from Bushire.

6. Nycteris thebaica Geoffr.

a–h (in alc.). Myba, 1760 feet, 17th August.

7. Scotophilus schlieffeni Pet.

a. Jimel, 16th August.
b–f. Sheikh Othman, 18th–27th September.
g, *h* (in all.). Lahej.

8. Taphozous perforatus Geoffr.

a–d. Lahej, 22nd August.
e, *f* (in spirit). Lahej, 22nd August.

9. Rhinopoma microphyllum Geoffr.

a–g. Myba, 17th August.

"*Small Bats* (various).—Most of the villages in the interior of S. Arabia have one or more towers, into which they drive the pick of their stock, and into which they retreat for a last stand in case of war. They are built of mud or stone (Nub, Dar, or Hassan[2]). In times of peace they are, as a rule, only used as store-houses for grain, &c. In these towers Bats live in hundreds, one or two species in each tower.

"In the Sultan's palace at Lahej the passages leading to his private apartments are haunted by hundreds of Bats, and the strong pungent smell is almost unbearable. They were difficult to get at, as the roof is formed of sticks put across from wall to wall, and it is in between the sticks that the Bats hang. There were more Bats in Dar Mansur[3] than any other place I have seen. Their droppings were fully 6 in. deep in many parts of the tower. The smell was terrible, but not quite so bad as at the palace, the reason being that Dar Mansur is a ruin, more open and drier than the palace. In this tower there only seemed to be two species—the Long-eared, *Nycteris thebaica*, and the Long-tail, *Rhinopoma microphyllum*: these two were the commonest species we met with; as a rule they were to be found in every tower, and perhaps we would get one other species in small numbers as well. The long-tails were the worst Bat to skin I have seen; they were so very fat—a regular store of fat being at the base of the tail. One or two Bats were shot round the Lahej bungalow and a few at Sheikh Othman, but most were caught in towers or in caves in banks of wadis. It is quite a sight to see the hundreds of Bats streaming out of these towers in the dusk and scattering all over the place. Some of them are very high fliers, and at once shot up, while others never seemed to go far and would hang round the villages."

[1] Cat. Mamm. Ind. Mus. i. p. 113 (1881).
[2] Nub or Dar = a tower of mud or unburnt bricks. Hassan = a stone tower.
[3] = Mansur's Tower.

10. Felis maniculata Cretzschm.

a. ♀. Lahej, 27th August. "Shot on desert in bush." Native name "Erri."

It is impossible to say with any certainty what specific name should be used for this little Wild Cat until the whole group has been properly revised. Additional material from all localities is much needed.

"*Wild Cat.*—Only this one specimen was obtained, though I tried hard to get another with the traps. We were riding out towards Shaka, a village above Lahej, when the shikari pointed out this cat slinking off towards Wadi Bilih: away we went as hard as the camels could go and managed to cut the beast off from the wadi—a bit of a run over the desert, and she took refuge in a bush. I jumped down, took off my coat, went in and managed to pull her down as she bolted. On examination we found it was a female, and had, I think, young ones still sucking. When in the open desert the colour was most perfect, blending with the sand. I afterwards saw spoor in the wadi which I put down to this animal or one very near it. It was just after dawn when we killed this cat, so I suppose she was just returning from a night's hunting."

11. Felis caracal Güld.

a. Habil, W. of Lahej, 26th September.

"*Lynx.*—The Lynx was caught in a trap set for Hyæna on night of September 26th at Wadi El Kabir. He was a pleasant looking creature in the morning when we visited the trap; as I wished to get down into Sheikh Othman quickly, I thought I would take him down alive. We made a couple of nooses and threw over the beast's head, drew them tight, and an Arab shoved a sack over him, loosed off the traps and then tied up the legs of our prisoner; we all lost skin and blood in the process. Into my Horig[1] he went, and off I set for the bungalow. On arrival I found the poor beast dead, one of the nooses not having come off—so I had to turn to there and then, and make a skin of him.

"I think the beast is not uncommon, for I saw spoor on many occasions near villages, and twice I was sent for to come and shoot an animal that was doing great damage among the sheep—always tearing the throat out. Now a wolf almost invariably attacks the flank and kills that way, so it was no wolf, and the only other animal I could put it down to was this cat. Native information is more unreliable in Arabia than anywhere I have been; they know nothing of habits of animals, nor do they know tracks of different beast when they see them."

12. Hyæna hyæna L.

a. Habil, 25th September.

"*Hyæna.*—We were very unfortunate with Hyænas, for they were not rare, their spoor to be seen almost any morning, but they kept

[1] Large saddle-bag on Camel.

out of sight and out of our traps, only the one specimen being caught, and the man who went round to visit the trap unfortunately put a bullet into the lower jaw, breaking it. They keep to the hills and only come into the desert at night, although, if a meal is to be found, they often lie up in the nearest wadi that offers shelter for several nights or till the feed is finished. I never found any dead beasts that were being visited, or would have poisoned the carcass and spoored up any beast that had fed. Putting down poisoned meat was a failure (except so far as pariah dogs were concerned, and I got a good bag of them), no Hyæna ever coming near my baits; foxes came, looked at them and passed on; in fact, poison was an utter failure."

13. Canis pallipes Sykes.

a. Lahej.—Presented by the Sultan of Lahej.

This specimen, like those from Muscat obtained by Surg.-Gen. Jayakar, no doubt represents Noack's *Canis hadramauticus*[1], described from puppies so young as to be useless for purposes of comparison. But, as before, I can see no valid reason for distinguishing the Arabian Wolf from that found in Iinia[2]. Its nearest African ally is *C. lupaster*, Hempr. & Ehr.

"*Wolf*.—Not uncommon in the hills, where it does much harm to flocks of sheep and goats, even attacking donkeys and tearing the flank.

"My only specimen was presented by the Sultan of Lahej."

14. Vulpes leucopus Bly.

a. ♂. Sheikh Othman, 15th September.

b. ♀. Wadi Bilik, near Shaka, N.W. of Lahej.

The latter specimen was shot while it was lying in wait for *Meriones rex*.

"*Fox* (native name 'Derain' or 'Ali ben Thile,' meaning son of a lawyer).—Not uncommon but difficult to obtain; feed chiefly on rats and mice. I twice saw them watching the burrows of *Meriones rex* (tuft-tail rats) and on one occasion bagged a female. My other specimen was shot just outside Sheikh Othman."

15. Mellivora ratel Sparrm.

a–c. Habil, September.

The specimens differ among themselves in coloration. One has a white-tipped tail, as occurs occasionally in Abyssinian examples; in the others the tails are black throughout.

16. Gerbillus pœcilops Yerb. & Thos.

a–e. Lahej, 22nd to 24th August.

f–g. Wani Bana, 29th to 30th September.

h. El Khaur, 3rd October.

[1] Zool. Anzeiger, 1896, p. 356.

[2] In Mr. de Winton's able paper on Canidæ (P. Z. S. 1899, p. 536), I find that he has "no hesitation in referring to *C. pallipes*" a skull from Aden in the British Museum.

Further examples of this interesting species are very welcome. The adults of this series are quite similar to the type, although taken in the autumn, while that was captured in spring.

17. Gerbillus famulus Yerb. & Thos.

a–i (skins). El Khaur, 29th Sept. to 10th Oct. 1899.
j, *k* (in al.). Ditto, ditto.

This species, described from a specimen with an imperfect tail, proves to have one of the longest and handsomest tails found among the Gerbilles.

The following are the measurements of a pair of the El Khaur specimens measured in the flesh:—

♂. Head and body 105 mm.; tail 150; hind foot 27; ear 19.
♀. „ 100 mm.; „ 145; „ 28; „ 17.

For its terminal three inches the tail is prominently crested with black, the sides and under surface being short-haired and white; the crest-hairs forming the terminal pencil attain a length of 15 or 16 mm.

The type-specimen had only 4 plantar pads, but one of the two spirit-specimens from El Khaur has 5 and the other 6, thus giving further evidence of the unreliability of this character in the present group. At the same time the difference between the specimens in this respect is not really so great as it appears, for the pads are surrounded by granulations, and it is only a slight increase in size over its fellows which makes a "granule" worthy of the name of a "pad."

18. Gerbillus sp.

a, *b*. Sheikh Othman, 23rd–24th September.
c (in al.). Abyan Hill country, E. of Aden. Taken from the stomach of *Cerastes cornutus*.

Allied to *G. nanus* Blanf. and *G. dasyurus* Wagn. Not certainly determinable with the materials at present available.

19. Gerbillus gerbillus Oliv.

a (in spirit). El Khaur.

This is the first recorded occurrence of one of the hairy-footed group of Gerbilles (subgenus *Gerbillus*) in Arabia, but their presence was quite to be expected, *Gerbillus gerbillus* occurring in Egypt, and *G. gleadowi* in Sind.

"Picked up dead in the Desert."

20. Meriones rex Yerb. & Thos.

a–d. Shaka, about 15 miles N.W. of Lehej, 30th–31st August.

Quite similar to the original series collected by Col. Yerbury at Lahej.

"*Large Tuft-tail Rat.*—These Rats were common in the wadis near Shaka, but I never saw them elsewhere. They live in large colonies of 40 or 50 holes, are arboreal feeders, all we got being shot in the bushes feeding on shoots; they come out in evening

and early morning, and are very playful. They would not look at the traps, as I suppose the bait was not correct, and yet we tried all sorts of bait we could get. Their holes are a home for many lizards, including a monitor or 'Waral.' I saw one, but was not able to get a shot, he went down the hole too quickly for me. It appeared to be about 2 ft long."

21. Arvicanthis variegatus Licht.

a–d. Lahej, 21st Aug. to 15th September.
e (in al.). Lahej.

22. Mus rattus alexandrinus Geoffr.

a, *b*. Lahej, 21st August.

23. Mus (*musculus-bactrianus* group).

a, *b*. Lahej. August and September.
c, *d*. Sheikh Othman. 26th & 27th September.

For want of material it is not at present possible to determine satisfactorily the Mice of this difficult group.

24. Acomys dimidiatus Rüpp.

Many specimens. El Khaur, September and October, 1899.

The variation in colour in this series is very considerable, some being almost entirely sandy rufous, and others slaty with merely a slight wash of sandy on their flanks.

"*Spiny-back Mice*.—These interesting little mice gave us a lot of bother, for they appear to be a great dainty to the ants, and the first six or more were all spoilt—ears and noses were always eaten off. At Al Khaur in the Abyan Country we began to get specimens, and by going round the traps with a light late at night we got our specimens quite fresh. Any that were in the traps in the morning were, as usual, eaten by ants. They seem to like to be near water, for we caught nearly all close to the stream or cuttings.

"I am not at all sure about the food of these mice; I don't think they climb trees, as do most of the mice we caught. I shot several mice and rats in the trees in the dusk, but the spiny-backs seem to keep to the ground. Our traps were of awkward sizes, the small traps were inclined to hit mice on the skull and break it, while the big ones almost cut them in two.

"The spiny-backs are the most tender-skinned mammal I have met; the skin is more like wet blotting-paper than anything else, and the least thing damages them. They are early movers, in fact are often out during the day. I was very anxious to get some alive, but never was able to capture any."

25. Hystrix leucura Sykes.

a. Sheikh Othman, 20th September.

This specimen confirms my previous reference of the Aden Porcupine to *H. leucura*, the Indian species, and shows no approximation to the African forms.

26. Lepus arabicus Hempr. & Ehr.

a. ♂. Shaka, 29th August.
b. Hiswa, 20th September.
c. Young. La Mileh, 16th August.

"Fairly common in the more fertile wadis, but extremely difficult to shoot—unless you have a good camel that will stand when you tell it to: then, by following as quickly as possible among the bushes, one can get them. I only shot 4 all the time I was out. Breeding-time must be about October, as the female got at Sheikh Othman late n September was in kindle, 6 young ones."

27. Procavia syriaca jayakari Thos.

a. Abyan Mountains, 70 miles N.E. of Aden.

This is the first Dassy obtained in the Aden region, the previous examples of the subspecies having come from Dofar, halfway towards Muscat (*Jayakar*), and from Nejd in Central Arabia (*Schweinfurth*).

"*Hyrax*.—Not rare in the hills behind Shukra, but very difficult to get within shot, as the Bedouins are always hunting them for food; I saw 20 or more in one place, but they all cleared before I got within 100 yards. I saw a lot of snares set for them, but while I was in the district none were captured: the snares were set in the mouth of a hole. The hyrax is not much of a wanderer and feeds close to his hole. There are two species of Eagle about the hills which subsist almost entirely on them, so they have plenty of foes. According to a Bedouin from Dethina[1], the Leopards live to a large extent on Dassies, which seem to be very common in Dethina, and Leopards are fairly numerous."

28. Capra sinaitica Hempr. & Ehr.

a. Skull and horns. Abyan Mountains.

3. A Revision of the Butterflies of the Genus *Zizera* represented in the Collection of the British Museum. By Arthur G. Butler, Ph.D., F.L.S., F.Z.S. &c.

[Received January 18, 1900.]

(Plate XI.)

Whilst rearranging the Museum series of "Blues" referable to the genus *Zizera*, I have discovered so much of interest, that, although at present I am not prepared to assert that the genus is a good one (when examined structurally), I feel that a revision of it is greatly needed.

In De Nicéville's 'Butterflies of India,' a work of great merit and therefore deserving of all respect, I find certain species regarded as synonyms which to me appear to be as distinct as

[1] Dethina lies some 200 miles N.E. of Aden.